

What is claimed is:

1. A vehicular drive shaft assembly adapted for being balanced about an axis of rotation, the vehicular drive shaft assembly comprising:
  - a drive shaft tube having a first end and a second end;
  - 5 a first tube yoke including a first radially outer wall fixedly mounted to the first end of the drive shaft tube;
  - a first balance pendulum located radially inward of the first outer wall and rotationally fixable relative to the first tube yoke;
  - 10 a second balance pendulum located radially inward of the first outer wall and rotationally fixable relative to the first tube yoke; and
  - a second tube yoke fixedly mounted to the second end of the drive shaft tube.

2. The vehicular drive shaft assembly of claim 1 wherein the second tube yoke includes a second radially outer wall that is fixedly mounted to the second end of the drive shaft tube, and wherein the vehicular drive shaft assembly further includes a third balance pendulum located radially inward of the second outer wall and rotationally fixable relative to the second tube yoke, and a fourth balance pendulum located radially inward of the second outer wall and rotationally fixable relative to the second tube yoke.

- 20 3. The vehicular drive shaft assembly of claim 2 wherein the third balance pendulum includes a base portion adjacent to the axis of rotation and mounted to the second tube yoke, a balance weight spaced from the axis of rotation, and an arm connected between the base portion and the balance weight; and the fourth balance pendulum includes a base portion adjacent to the axis of rotation and mounted to the third pendulum, a balance weight spaced from the axis of rotation, and an arm connected between the base portion of the fourth balance pendulum and the balance weight of the fourth balance pendulum.

4. The vehicular drive shaft assembly of claim 3 wherein the first balance pendulum includes a base portion adjacent to the axis of rotation and mounted to the first tube yoke, a balance weight spaced from the axis of rotation, and an arm connected between the base portion of the first balance pendulum and the balance weight of the first balance pendulum; and the second balance pendulum includes a base portion adjacent to the axis of rotation and mounted to the first pendulum, a balance weight spaced from the axis of rotation, and an arm connected between the base portion of the second balance pendulum and the balance weight of the second balance pendulum.

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5. The vehicular drive shaft assembly of claim 1 wherein the first balance pendulum includes a first base portion adjacent to the axis of rotation and mounted to the first tube yoke, a first balance weight spaced from the axis of rotation, and a first arm connected between the first base portion and the first balance weight.

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6. The vehicular drive shaft assembly of claim 5 wherein the second balance pendulum includes a second base portion adjacent to the axis of rotation and mounted to the first base portion, a second balance weight spaced from the axis of rotation, and a second arm connected between the second base portion and the second balance weight.

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7. The vehicular drive shaft assembly of claim 6 wherein first balance pendulum has a predetermined size and weight and the second balance pendulum has a predetermined size and weight such that, when the first balance pendulum is oriented about the axis of rotation 180 degrees from the second balance pendulum, the first balance pendulum and the second balance pendulum will be generally rotationally balanced relative to the axis of rotation.

8. The vehicular drive shaft assembly of claim 6 further includes a first tack weld located between the first base portion and the first tube yoke, and a second tack weld located between the second base portion and the first base portion.

5 9. The vehicular drive shaft assembly of claim 1 wherein the first balance pendulum is rotationally fixed to the first tube yoke by a first tack weld, and the second balance pendulum is rotationally fixed relative to the first tube yoke by a second tack weld.

10 10. The vehicular drive shaft assembly of claim 1 wherein the first tube yoke includes a threaded bore therethrough, and the first balance pendulum includes a first base having external threads thereon that thread through the bore such that the base is partially exposed outside of the drive shaft assembly.

15 11. The vehicular drive shaft assembly of claim 10 wherein the first base includes a slot exposed outside of the drive shaft assembly which thereby allows for detecting and adjusting the rotational position of the first balance pendulum.

20 12. The vehicular drive shaft assembly of claim 11 wherein the first balance pendulum includes a threaded bore therethrough, and the second balance pendulum includes a second base having external threads thereon that thread through the bore in the first balance pendulum such that the second base is partially exposed outside of the drive shaft assembly.

25 13. The vehicular drive shaft assembly of claim 10 wherein the first balance pendulum includes a threaded bore therethrough, and the second balance pendulum includes a second base having external threads thereon that thread through the bore in the first balance pendulum such that the second base is partially exposed outside of the drive shaft assembly.

14. The vehicular drive shaft assembly of claim 13 wherein the second base includes a slot exposed outside of the drive shaft assembly which thereby allows for detecting and adjusting the rotational position of the second balance pendulum.

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15. A vehicular drive shaft assembly adapted for being balanced about an axis of rotation, the vehicular drive shaft assembly comprising:

- a drive shaft tube having a first end and a second end;
- a first tube yoke fixedly mounted to the first end of the drive shaft tube;
- 10 a first balance pendulum rotationally fixable relative to the first tube yoke and located within the drive shaft tube;
- a second balance pendulum rotationally fixable relative to the first tube yoke and located within the drive shaft tube;
- 15 a second tube yoke fixedly mounted to the second end of the drive shaft tube;
- a third balance pendulum rotationally fixable relative to the second tube yoke and located within the drive shaft tube; and
- a fourth balance pendulum rotationally fixable relative to the second tube yoke and located within the drive shaft tube.

20 16. The vehicular drive shaft assembly of claim 15 wherein the first balance pendulum includes a first base that mounts to the first tube yoke such that the base is partially exposed outside of the drive shaft assembly, and the second balance pendulum includes a second base that mounts to the first balance pendulum such that the second base is partially exposed outside of the drive shaft assembly.

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17. A method of balancing a vehicular drive shaft assembly comprising the steps of:

- mounting a first balance pendulum to a first tube yoke;
- mounting a second balance pendulum to the first balance pendulum;

securing the first tube yoke to a first end of the drive shaft tube such that the first and second balance pendulums are located within the drive shaft tube;

securing a second tube yoke to a second end of the drive shaft tube;

measuring the out of balance of the vehicular drive shaft assembly after the first 5 and second tube yokes have been secured to the drive shaft tube;

if the vehicular drive shaft assembly measures out of balance, adjusting the orientation of at least one of the first balance pendulum and the second balance pendulum relative to the first tube yoke in response to the out of balance measurement; and

10 rotationally fixing the first and second balance pendulums relative to the first tube yoke.

18. The method of claim 17 further comprising the steps of:

mounting a third balance pendulum to the second tube yoke prior to securing 15 the second tube yoke to the second end of the drive shaft;

mounting a fourth balance pendulum to the second tube yoke prior to securing the second tube yoke to the second end of the drive shaft;

if the vehicular drive shaft assembly measures out of balance, adjusting the orientation of at least one of the third balance pendulum and the fourth balance 20 pendulum relative to the second tube yoke in response to the out of balance measurement; and

rotationally fixing the third and fourth balance pendulums relative to the second tube yoke.